

# Linux-Troubleshooting-Scenarios

It is always crucial to understand the issue. There should be the right approach or a step-by-step process to be followed to troubleshoot the issues. Doesn't matter you are a Software Developer or DevOps Engineer or an Architect, Unix./Linux is used widely and you should be aware with the issues and correct approach to resolve it.

Let's discuss on the few of them :

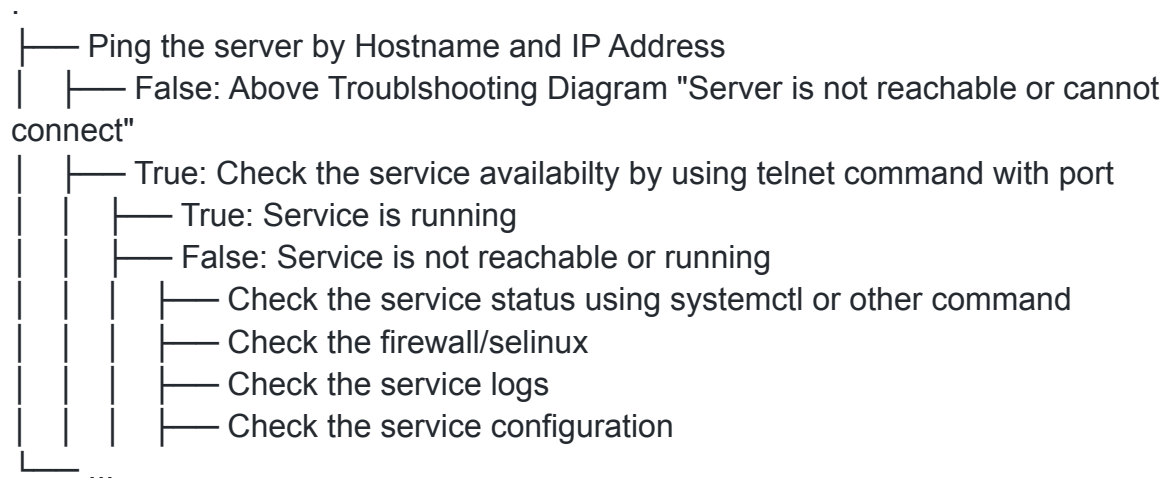
## Issue 1 : Server is not reachable or unable to connect

### Approach / Solution :

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|
|—— Ping the server by Hostname and IP Address
| |
| |—— Hostname/IP Address is pingable
| | |
| | |—— Issue might be on the client side as server is reachable
| | |
| | |—— Hostname is not pingable but IP Address is pingable
| | | |
| | | |—— Could be the DNS issue
| | | | |
| | | | |—— check /etc/hosts
| | | | |—— check /etc/resolv.conf
| | | | |—— check /etc/nsswitch.conf
| | | | |—— (Optional) DNS can also be defined in the
| | | | | /etc/sysconfig/network-scripts/ifcfg-<interface>
| | |
| | |—— Hostname/IP Address both are not pingable
| | | |
| | | |—— Check the other server on its same network to see if there is Network side
| | | | access issue or other overall something bad
| | | | |
| | | | |—— False: Issue is not overall network side but its with that host/server
| | | | |—— True: Might be overall network side issue
| | | |
| | | |—— Logged into server by Virtual Console, if the server is PoweredON. Check
| | | | the uptime
| | | | |
| | | | |—— Check if the server has the IP, and has UP status of Network interface
| | | | |—— (Optional) Also check IP related information from
| | | | | /etc/sysconfig/network-scripts/ifcfg-<interface>
| | | | |
| | | | |—— Ping the gateway, also check routes
| | | | |—— Check Selinux, Firewall rules
| | | | |—— Check physical cable conn
```

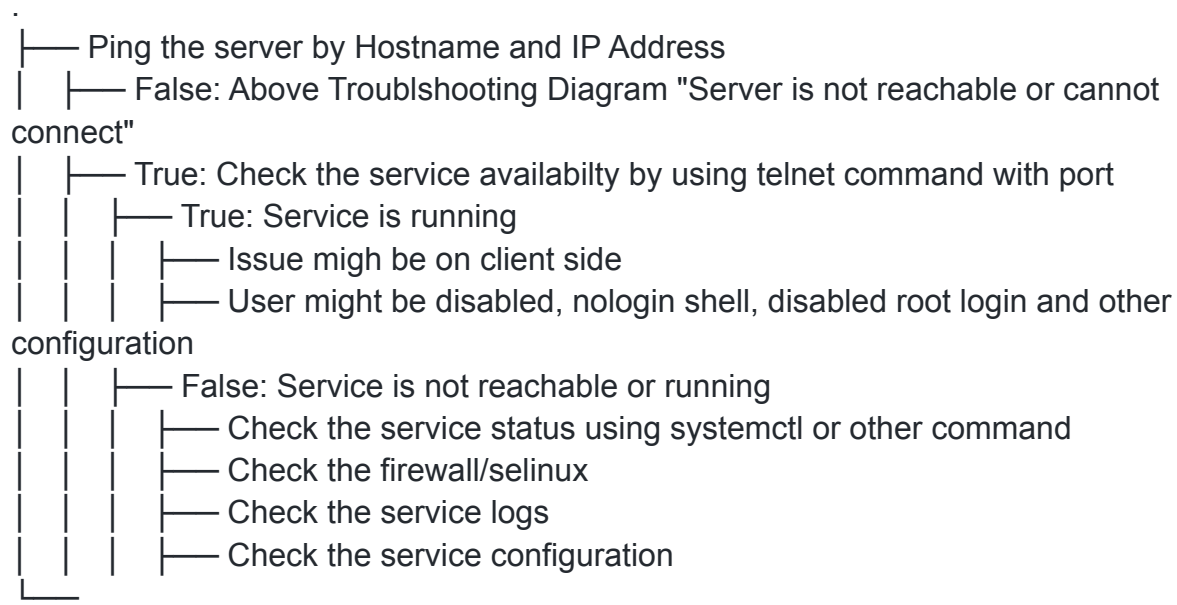
## Issue 2 : Unable to connect to website or an application

### Approach / Solution :



### Issue 3 : Unable to ssh as root or any other user.

### Approach / Solution :



### Issue 4 : Disk Space is full issue or add/extend disk space

### Approach / Solution :

- System Performance degradation detection
    - Application getting slow/unresponsive
    - Commands are not running (For Example: as / disk space is full)
    - Cannot do logging and other etc
  - Analyse the issue
    - df command to find the problematic filesystem space issue
  - Action
    - After finding the specific filesystem, use du command in that filesystem to get which files/directories are large
      - Compress/remove big files
      - Move the items to another partition/server
      - Check the health status of the disks using badblocks command (For Example: `#badblocks -v /dev/sda`)
    - Check which process is IO Bound (using iostat)
    - Create a link to file/dir
  - New disk addition
    - Simple partition
      - Add disk to VM
      - Check the new disk with df/lslblk command
      - fdisk to create partition. Better to have LVM partition
      - Create filesystem and mount it
      - fstab entry for persistent
    - LVM Partition
      - Add disk to VM
      - Check the new disk with df/lslblk command
      - fdisk to create LVM partition
      - PV, VG, LV
      - Create filesystem and mount it
      - fstab entry for persistent
    - Extend LVM partition
      - Add disk, and create LVM partition
      - Add LVM partition (PV) in existing VG
      - Extend LV and resize filesystem
- ...

## Issue 5 : Filesystem corrupted

**Approach / Solution :**

- One of the error that cause the system unable to BOOT UP
- Check /var/log/messages, dmesg and other log files
- If we have a badsector logs, we have to run fsck
  - True:
    - reboot the system into rescue mode as booting it from CDROM by applying ISO
    - proceed with option 1, which mount the original root filesystem under /mnt/sysimage
    - edit fstab entries or create a new file with the help of blkid and reboot
    - ...

### **Issue 6 : fstab file missing or bad entry**

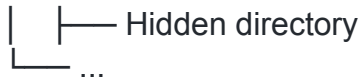
#### **Approach / Solution :**

- One of the error that cause the system unable to BOOT UP
- Check /var/log/messages, dmesg and other log files
- If we have a badsector logs, we have to run fsck
  - True:
    - reboot the system into rescue mode as booting it from CDROM by applying ISO
    - proceed with option 1, which mount the original root filesystem under /mnt/sysimage
    - edit fstab entries or create a new file with the help of blkid and reboot
    - ...

### **Issue 7 : Can't cd to the directory even if user has sudo privileges**

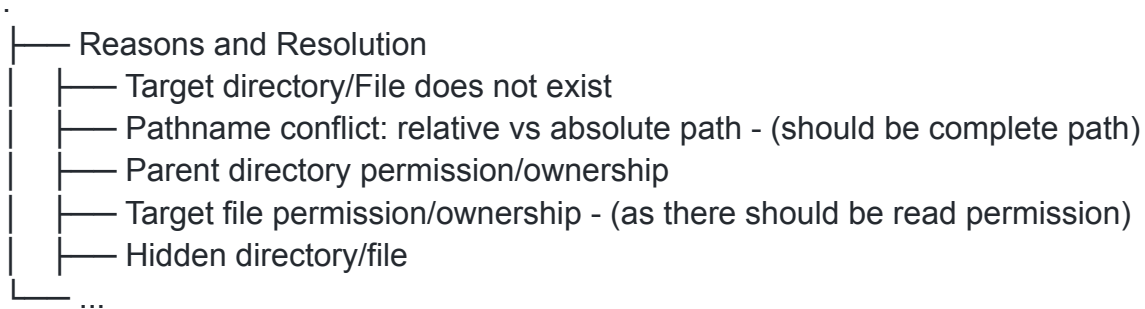
#### **Approach / Solution :**

- Reasons and Resolution
  - Directory does not exist
  - Pathname conflict: relative vs absolute path
  - Parent directory permission/ownership
  - Doesn't have executable permission on target directory



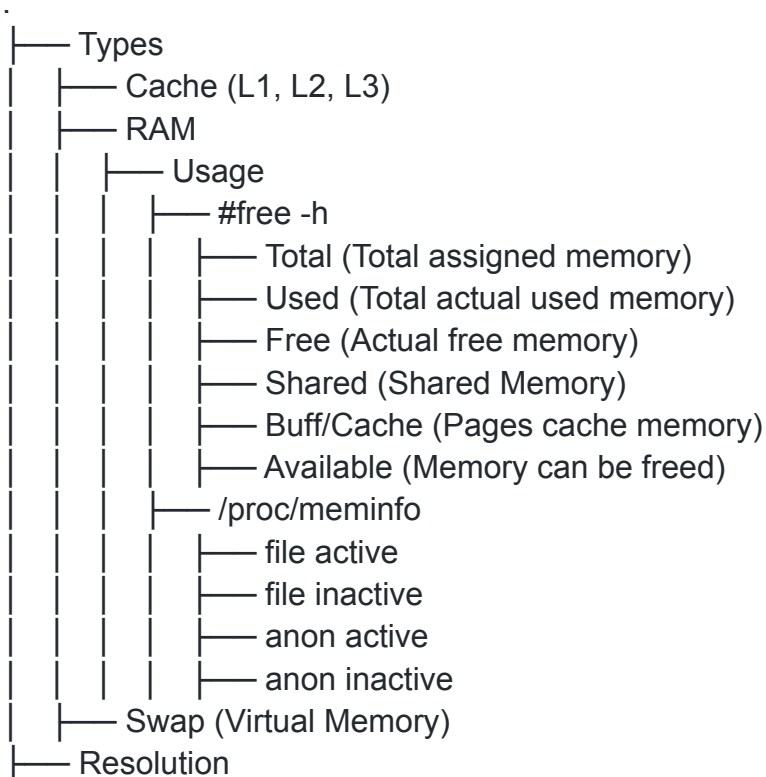
## Issue 8 : Can't Create Links

### Approach / Solution :



## Issue 9 : Running Out of Memory

### Approach / Solution :



- | |— Identify the processes that are using high memory using top, htop, ps etc.
- | |— Check the OOM in logs and also check if there is a memory commitment in sysctl.conf
- | |— Kill or restart the process/service
- | |— prioritize the process using nice
- | |— Add/Extend the swap space
- | |— Add more physical more RAM
- | ...

## Issue 10 : Add/ Extend the Swap Space

### Approach / Solution :

- |— Due to running out of memory, we would need to add more swap space
- | |— Create a file with #dd, as it will reserve the blocks of disk for swap file
- | |— Set permission 600 and give root ownership
- | |— #mkswap
- | |— Now Turned swap on #swapon
- | |— fstab entry for persistent
- | ...

## Issue 11 : Unable to Run Certain Commands

### Approach / Solution :

- |— Troubleshooting and Resolution
- | |— command
- | | |— Could be the system related command which non root user does not have the access
- | | |— Could be the user defined script/command
- | |— Troubleshooting
- | | |— permission/ownership of the command/script
- | | |— sudo permission
- | | |— absolute/relative path of command/script
- | | |— not defined in user \$PATH variable
- | | |— command is not installed

| | | — command library is missing or deleted  
| | |  
| | | ...

## Issue 12 : System Unexpectedly reboot and process restart ?

### Approach / Solution :

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| — Troubleshooting and Resolution  
| | — System reboot/crash reasons  
| | | — CPU stress  
| | | — RAM stress  
| | | — Kernel fault  
| | | — Hardware fault  
| | — Process restart  
| | | — System reboot  
| | | — Restart itself  
| | | — Watchdog application  
| | | | — To prevent high stress on system resources  
| | | | — If application causing stress, so it will restart or terminate  
| | — Troubleshooting  
| | | — After logged in, check the status by using commands like uptime, top,  
dmesg, journalctl, iostat -xz 1  
| | | — syslog.log, boot.log, dmesg, messages.log etc  
| | | — custom log path of applicatoin  
| | | — if not completely accessible, so take the virutal console like from ILO,  
IDRAC etc  
| | | — open a case and reach out a vendor  
| | |  
| | | ...

## Issue 13 : Unable to get IP Address

### Approach / Solution :

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| — IP Assignment Methods  
| | — DHCP  
| | | — Fixed Allocation

- | | | — Dynamic Allocation
- | | | — Static
- | — Troubleshooting
- | | — check network setting from virtualization environment like VMware, VirtualBox or etc
- | | — check the IP address is assigned or not
- | | — check the NIC status from host side using #lspci, #nmcli etc
- | | — restart network service
- | — ...

## Issue 14 : Backup and Restore File Permissions in Linux

### Approach / Solutions :

- | — Troubleshooting
- | | — The best option is to create the ACL file of Dir/Files before changing the permissions in bulk
- | | | — Create the acl file before changing the permission (or backup the file permission): ~\$ getfacl -R <dir> > permissions.acl
- | | | — Restore File Permissions: ~\$ setfacl --restore=permissions.acl
- | | — Restore from the VM Snapshot (But not always a good option for production)
- | | — Rebuild the VM (this option is safe for future)
- | — ...

### Useful Tip Related Disk Partition :

- | — Tips
- | | — After adding/attaching a new disk to a VM, we can get its status from lsblk command by doing ~\$echo 1 > /sys/block/sda/device/rescan
- | | — If we increase disk size of existing disk then the additional space get appended to the existing disk without affecting the already existed FileSystem and Partition
- | | — We can also recreate the filesystem on block device as it will automatically format the old one
- | | — If we have a disk(with created partition/FS) we can share the .vmdk to other VM. So after mounting we would have a same data as it was on previous one.
- | — ...



